



SAFETI Newsletter

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Safe Aqua Farming for Economic and Trade Improvement (SAFETI)
Supporting the Bangladesh Shrimp and Prawn Sector



About the SAFETI Project

Aquaculture plays a central role in nutrition and livelihood for more than 12 million people in Bangladesh. Bangladesh has been very successful in expanding freshwater aquaculture, with an average growth rate of 8.1 percent per annum for the period 2000-17, and a current annual production of more than two million tonnes of aquaculture products from ponds and stocked water bodies. This is one of the Government of Bangladesh's great accomplishments. However, during the same period, the production of shrimp (primarily the black tiger shrimp *Penaeus monodon* known locally as *Bagda*) and prawn (primarily the giant freshwater *Macrobrachium rosenbergii* known locally as *Golda*) has not shown the same growth.

Pond productivity in Bangladesh remains low relative to elsewhere in the world; in 2016-17 it was only 332 kg/ha.yr for bagda and 724 kg/ha.yr for golda, in comparison with up to 4,000 kg/ha.yr in India and Thailand. Moreover, annual exports peaked at 54,891 t in 2010-11 and have been in decline since, falling to 36,176 t in 2017-18.

Bangladesh has the potential to be a major global producer and exporter of shrimp and prawn. The country has brackish and fresh water pond areas of 272,000 ha. locally called gher and vast areas of rice fields and natural water bodies suitable for the supplementary production of freshwater prawn. It benefits from favourable climate, soil and salinity conditions that would allow production of two or more shrimp and/or prawn crops per year. The aim of the SAFETI project is to support Bangladesh's efforts to capitalize on this potential.

Funded by USDA and implemented by the US non-profit organization Winrock International, the SAFETI project is working with public-private partners to increase shrimp and prawn production, quality, and exports. Over five years, the project will work with 25,000 direct beneficiary farmers with the target of raising their annual production to an average of 500 kg per hectare. This will be achieved through technical training, linkage with quality inputs like seed, feed, chemicals and back-up support, plus access to appropriate finance by the farmers. The project will also work with input suppliers, hatcheries, processors, Government organizations and trade associations to address other constraints to the successful development of the sector. Expansion of improved technologies to an additional 440,000 farmers is an indirect beneficiary target for the project.

In 2018, SAFETI is working with 9,500 farmers in 380 clusters of 25 farmers per cluster. The clusters are located in 38 unions in 10 upazilas that are distributed among Bagerhat, Khulna, Satkhira and Jashore. SAFETI is also working with hatcheries and intensive shrimp farms in Cox's Bazar and with a number of other stakeholders, e.g., processors, feed producers, etc.

A message from the COP

Winrock International has been working in the development sector in Bangladesh for more than 30 years and currently has six projects active in the country.

The SAFETI project aspires to trigger a significant change in the way shrimp farming is done in Bangladesh. Farmers could be making much better profits if some deep seated constraints can be overcome. The leading one of these is the high incidence of disease in the post larval shrimp that farmers stock. This leads to high mortalities in the ghers and low production of shrimp.

SAFETI is working with the Government and a group of skilled NGO partners to help move the industry towards more profitable shrimp-farming practices so that the great potential the country has for successful shrimp and prawn production can be realized. SAFETI is just completing its support to the first production season and 9,500 farmers, the results of which will determine the project's continuing activities and success.



SAFETI CoP Dr. John Dorr receiving a crest for the project's participation in National Fish Week Fair-2018

SAFETI Partnership

In 2017, the SAFETI project established partnerships with the Bangladesh Shrimp and Fish Foundation (BSFF), Community Development Centre (CODEC), Thengamara Mohila Sabuj Sangha (TMSS), WorldFish and Auburn University, USA.

BSFF is a non-profit private organization working in Bangladesh for more than a decade on research, advocacy and targeted actions at all levels of the value chain in the fisheries sector, aquaculture and shrimp industry. SAFETI signed a partnership agreement with BSFF on July 30, 2017. BSFF will help the project's efforts in the areas of policy and regulatory aspects of shrimp production and export.

TMSS, a Bangladeshi NGO operating nationwide, was founded in 1980, and has been implementing fisheries development projects since that time in southern districts of Bangladesh. The SAFETI-TMSS partnership agreement was signed on July 9, 2017.



Partnership agreement signing between SAFETI and BSFF



Partnership agreement signing with TMSS (left) and CODEC (right)

CODEC is another implementing partner of SAFETI, and has been working as a people-centered development organization since 1985 in the Chattogram Division and in southern areas of Bangladesh. The SAFETI-CODEC partnership agreement was signed on July 10, 2017.

As implementing partners, TMSS and CODEC will help in mobilizing farmers' activities including the selection and formation of farmer groups, organizing farmers for training, coaching, conducting demonstrations, linking with quality inputs and providing appropriate lending for shrimp and prawn farming.

WorldFish is an international, nonprofit research organization that harnesses the potential of fisheries and aquaculture to strengthen livelihoods and improve food and nutrition security. As a SAFETI technical partner, WorldFish will help in the areas of shrimp and prawn disease diagnostics and surveillance. SAFETI and WorldFish signed a partnership agreement on October 26, 2017.



Partnership agreement signing with WorldFish

An agreement with Auburn University was signed on October 12, 2018.

SAFETI: Supporting the Bangladesh Shrimp and Prawn Sector

Baseline

A baseline survey was carried out during March–April 2017 in all five project-targeted Districts of SAFETI, to check the validity of the assumptions underlining the project design, and to establish the pre-activity values of 17 performance evaluation indicators. The Dhaka based company Consiglieri Private Limited was selected to carry out the survey. Assessment of the survey results was completed in September 2017.

Four hundred shrimp and prawn farmers were interviewed in the study. In addition, 75 other market actors including four prawn hatchery owners, six shrimp hatchery owners, ten sellers of feed and other inputs, eight owners of shrimp nurseries (pre-growing seed to a larger size before stocking in ponds), seven farias (small traders buying shrimp from farmers and selling on), seven aratdars (auctioneers of harvested shrimp), five agents (financing post-harvest actors and controlling product flows), five processors, two feed manufacturers, seven Department of Fisheries senior staff, two representatives from trade associations, and two overseas buyers were also interviewed during the survey.

The most instructive finding of the baseline survey was that low productivity is the key issue affecting the entire shrimp/prawn sector, including the profitability of farmers and of many upstream and downstream actors. The baseline survey

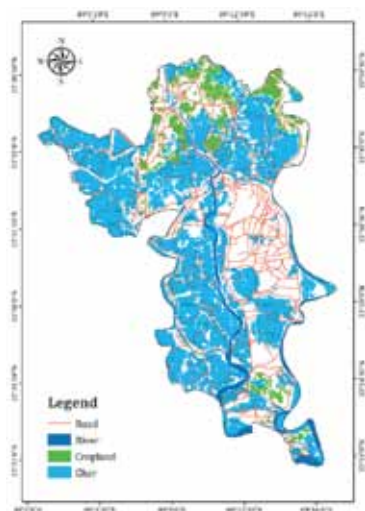


Discussion with the farmers for baseline information

found productivity levels to be about 300 kg/ha.yr for prawn and shrimp. This contrasted with a Government reported average of 457 kg/ha.yr (DoF 2014 15), and with productivity in other countries of 4.3 t/ha.yr in Thailand and 2.6 t/ha.yr in India (FAO). This low productivity is holding back improvements in post-harvest handling, product quality and export value. Shrimp disease and unavailability of quality seed were identified as the main reasons for low productivity. The survey identified that Bangladeshi farmers in general, while aware of some aspects of modern shrimp and prawn farming technologies, seldom follow the key steps needed to ensure good production. Accordingly, the baseline survey identified some priority needs for SAFETI to address in the project areas: (1) the need for high quality, disease-free seed; (2) the need for improved pond infrastructure - minimum 1 m depth and access to quality water; (3) the need for improved methods of pond preparation and management, and maintenance of biosecurity; (4) the need for access to suitable financing; and (5) the need for improvement in post-harvest handling between the farmer and the auction center or depot (few farmers use ice), as well as improved traceability systems.

GIS Mapping

To identify the most suitable work areas for project activities, the project with the assistance of the Remote Sensing and GIS Laboratory, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh analyzed satellite imagery of gher areas. Geographic Information System (GIS) maps were prepared from the satellite data for the months of October/November/December and February/March, 2016 or 2017, covering twelve Upazilas in Bagerhat, Cox's Bazar, Jashore, Khulna, and Satkhira Districts. Seasonal changes in land use between paddy, shrimp and prawn-fish production were identified and rivers, canals etc. mapped. Using these maps, potential areas for shrimp and prawn farming were identified and discussions held with fishery officials and local people and visits made to the areas. Through this work SAFETI selected 10 upazilas distributed across Bagerhat, Jashore, Khulna and Satkhira for work with shrimp and prawn farmers.



Training of Trainers (ToT) Course for SAFETI staff

Capacity building of project staff is a vital step for any organization that aims at effective and efficient project delivery. SAFETI technical project staff need two separate sets of skills and knowledge. First, they need to have the technical understanding of the subject matter; second, they need to know how to transfer that technical knowledge to the farmer.



Inauguration speech by COP

Three 11-day long Training of Trainer (ToT) courses were organized for the SAFETI project staff at the CODEC training center, Bagerhat between September and November 2017. Each ToT course was conducted in two parts: Part-I took 6 days and covered the technical methodologies for semi-intensive shrimp and freshwater prawn farming. Part-2 was a 5-day course on training and extension methods.

Sixty-four participants from SAFETI Winrock, CODEC and TMSS attended the training course in three batches. Technical and extension resource staff of SAFETI and external resource persons from

private organizations, research institutes and universities combined their knowledge and experience in delivering training sessions.

The main objectives of the ToT course were to develop the relevant technical understanding of the project and capacity to transfer that technical knowledge to farmers.

Both the technical and extension methodologies courses were conducted through a combination of theory and practical sessions. Appropriate participative training techniques e.g., brainstorming, small group work, paired work, assessments, case studies, energizer games and Q&A methods were used during the courses.

The aim of the ToT course was to develop confident, competent SAFETI team members with the skills and knowledge on technical methodologies for semi-intensive shrimp and prawn farming, as well as training and extension skills.



Practical training session



Some participants' reflections about the course:

"It was excellent and I gained a great deal of knowledge from this training, and I think it will be very helpful for further field work."

"I enjoyed the training sessions, and found them to be highly relevant to our field activities."

Trainings, Workshops, Seminars, Meetings

Consultation Meeting on the “Current Situation of Freshwater Prawn Hatchery Operations and Way Forward”

The USDA SAFETI project organized a two-day consultation meeting on the “Current Situation of Freshwater Prawn Hatchery Operations and Way Forward” during November 27-28, 2017 at Kuakata, Patuakhali. Twenty-eight participants, including freshwater prawn hatchery owners, technicians, scientists, experts from universities and professionals from national and international institutions took part in the meeting. The major issues identified were: quality of inputs, larval mortalities of unknown cause, a need for healthy and disease free broodstock and a lack of expert manpower. To overcome these challenges, the participants recommended: (1) ensure all hatchery inputs are by a legal importer and ensure quality by government testing; (2) identify the underlying causes of the larval problems through a well-designed epidemiological study; (3) ensure disease free broodstock, ideally Specific Pathogen Free (SPF); and (4) develop a well trained cadre having relevant educational backgrounds, e.g., in fisheries.



Participants discussing at consultation meeting

Stakeholders' Consultation Meeting on “Freshwater Prawn and Shrimp Farming”



Group exercise at consultation meeting

The USDA SAFETI project organized a stakeholders' consultation meeting on “Freshwater Prawn and Shrimp Farming” in Patuakhali, in the southern part of Bangladesh on November 29, 2017. Thirty-five participants including various value-chain actors including shrimp and prawn farmers, private and public sector representatives attended the meeting. The meeting was organized to analyse the existing situation of shrimp/prawn farming in this region and to assess future prospects for undertaking activities with SAFETI or other development projects.

Seminar on “Recent International Developments in Shrimp Hatchery Technologies”

The SAFETI project held a three-day seminar on “Recent International Developments in Shrimp Hatchery Technologies” for bagda hatchery owners and technicians in Cox's Bazar during December 10-12, 2017.

Thirty-three participants including professionals from the public sector, and technicians, consultants and owners of bagda hatcheries participated in three mornings of presentations by national and international experts on the latest technologies in shrimp hatchery production around the world. Experts from Europe, India, Philippines, Thailand, USA and Vietnam gave updates on improvements in operating methods that could be of value to Bangladesh. The seminar resulted in a compendium of information and best practices in hatchery technology.



Participants of the seminar

Trainings, Workshops, Seminars, Meetings

Consultation Meeting on the “Current Situation of the Intensive Shrimp Farming Sector in Bangladesh and how to Promote Improvements,” Cox’s Bazar and Khulna

Two consultation meetings were held with current and potential intensive shrimp farmers on “The Current Situation of the Intensive Shrimp Farming Sector in Bangladesh - and how to Promote Improvements.” The first meeting in Cox’s Bazar on February 7, 2018 included 54 participants and a second in Khulna on February 12, 2018 had 78 participants. In addition to Winrock International and BSFF SAFETI staff, the attendees at the Cox’s Bazar meeting included 34 farmers, 4 local DoF staff, the Upazila Nirbahi officer (UNO), staff of BFRI and representatives of shrimp feed and pharmaceutical/chemical supply companies. At the Khulna meeting, 55 farmers participated from a cross section of medium and large scale intensive farms. In addition, the Joint Secretary of the Fish Farmers’ Association, the Director of the Bangladesh Frozen Foods Export Association (BFFEA), representatives from five aqua-feed & medicine companies, and three journalists from the daily newspapers *Prothom Alo* and *Purbachol* attended. At each event, working groups identified constraints, opportunities and solutions, and a set of recommendations was produced for distribution to decision-makers in Government and the private sector.



Consultation meetings at Khulna (left) and Cox’s Bazar (right)

Consultation Meeting on the “Shrimp and Prawn Feed Sector”

The SAFETI project organized a consultation meeting on the “Shrimp and Prawn Feed Sector” on March 11, 2018 in Khulna to understand the capacity and needs of agro-dealers and other input suppliers. The objective of this meeting was to discuss and understand the current status of the Shrimp and Prawn Feed Sector, including current market trends, quantity sold, consumption patterns, and to identify the constraints and the potential of the feed sector. Representatives of seven leading feed companies attended and took part in the consultation process along with BSFF, WorldFish representatives and SAFETI staff. In the meeting, market trends, technical extension services and possible collaboration opportunities with the SAFETI project were discussed.



Question and Answer session at consultation meeting

Field Events and Farmer Selection, Meetings and Trainings

The SAFETI extension staff organized informal meetings in the selected villages and discussed the project's objectives, and technologies. These meetings were followed by individual meetings with the candidate farmers to collect information on their resources and willingness to participate in the project. Based on the farmer's interest in adopting and investing in improved shrimp farming methodologies developed and promoted by SAFETI, 9,500 farmers were selected in 10 upazilas, in line with the Year 2 project target. These farmers are grouped in 380 clusters with 25 farmers in each cluster, and they will receive training and regular technical support from SAFETI.



Farmers' meeting adjacent to a SAFETI selected gher area



Farmers' Training on Bagda-Golda rotational farming

9,420 farmers in 380 clusters were trained in semi-intensive shrimp farming, shrimp-prawn rotational farming and prawn-carp polyculture farming. The training comprised three modules: Module I-pond preparation, PL stocking, income-expenditure and record keeping; Module II-post stocking management, feeding, water quality, health management; and Module III-postharvest management, sanitary and phytosanitary standards.

Self-motivated, entrepreneurial and community-accepted individuals were selected as lead farmers, and they have established demonstration farms that adopt the SAFETI promoted technologies. These participatory demonstration farms are a key learning point for the introduction of SAFETI promoted farming methodologies. Demonstration activities for semi-intensive shrimp and shrimp-prawn rotational farming began in mid-March 2018 and for prawn-carp polyculture in mid-April 2018. During August-September 2018, SAFETI organized coaching sessions for the farmers in all clusters on key points of the relevant farming technology. These field-based events were organized to provide technical guidance during the culturing period. SAFETI will provide two additional coaching sessions, two modules of refresher training and continue support for every cluster as follow-up to this initial round of training.

Once the demonstration farmers were selected and the first round of coaching completed, SAFETI organized exchange visits for some selected, interested, advanced and capable farmers to view successful, model ghers to inform and motivate them to adopt and replicate these successful farming systems in their own ponds.

During September 12-30, 2018, SAFETI organized 25 Farmer Field Days (FFD) to disseminate technology to an expanded group of farmers. The 6 Key Steps of SAFETI-promoted farming methodology were discussed and successful demonstration results were viewed by the participants which included DoF officials, feed and other input suppliers, and farmers. 353 similar FFDs will be held in the coming months.



Participants at SAFETI organized Farmer Field Day

SAFETI Partners with Bangladesh Department of Fisheries

On September 23, 2018, the Department of Fisheries (DoF) signed a Memorandum of Understanding (MoU) with the USDA SAFETI Project that is being implemented by Winrock International. The MoU authorizes joint collaboration between DoF and SAFETI to develop the shrimp and prawn sector in Bangladesh.

The signing ceremony was led by Mr. Abu Sayed Md. Rashedul Haque, Director General, DoF with Dr. John Dorr representing the SAFETI project. Several senior officials from DoF and senior SAFETI staff were also present. All participants welcomed this agreement and opportunity to work together to strengthen the shrimp and prawn sector.

Subsequently, a Project Technical Committee was formed under the auspices of the MOU to guide and monitor the implementation of the activities that will be undertaken jointly by DoF and SAFETI.



The MoU signing ceremony

Seminar on Feasibility of Introduction of Vannamei

On August 5, 2018, the SAFETI team participated in a seminar on “Feasibility of Introduction of Vannamei (*L. vannamei*) and Shrimp Sector Development in Bangladesh” jointly organized by the Department of Fisheries and the USDA SAFETI project. Mr. Narayan Chandra Chanda, MP, Hon’ble Minister, Ministry of Fisheries of Livestock (MoFL), Secretary, DG-DoF, DG-BFRI, senior officials from DoF and BFRI, development partners, representatives from BSFF,

BFEEA, SHAB, intensive shrimp/prawn farmers, hatchery owners, experts and private sector representatives attended the seminar.



SAFETI DCOP presenting the keynote paper

SAFETI DCOP presented the key note paper on the seminar on “*P. vannamei*: The Pacific white-legged shrimp - A review of the merits and demerits of a possible introduction of *P. vannamei* to Bangladesh” which was highly appreciated and accepted by the Minister, Secretary, Director Generals and all participants. A national working committee on Vannamei was formed after the seminar, with the SAFETI DCOP included as a key member.

SAFETI Participates in National Fish Week

National Fish Week is a major annual event organized by the Department of Fisheries (DoF), Bangladesh where the Government, private sector and development partners showcase innovation, activities and development in the aquaculture and fisheries sector. The USDA SAFETI project of Winrock International participated in different events during this year’s “National Fish Week – 2018” in Dhaka and in districts where SAFETI is implementing activities. In Dhaka, SAFETI set-up a display booth for the Fish Week Fair which received an award in the “Development Partners” category. Six SAFETI-supported farmers received awards for “Best Shrimp Farmer 2018” for outstanding shrimp production in their region.



SAFETI farmer receiving “Best Woman Shrimp Farmer” award

SAFETI's Six Steps for Increased Productivity and Profitability in Shrimp and Prawn Farming

In Bangladesh over 272,000 hectares of fresh and brackish water ponds (locally called “gher”) are estimated by the Department of Fisheries to be suitable for farming shrimp and/or prawns. Around 800,000 small-scale farmers are involved in production. However, productivity per hectare is very low compared to neighboring countries, overall production is not increasing and exports are actually declining. There is a major opportunity to increase productivity and national production. One of the key issues holding back improvement is the problem of frequent disease outbreaks. These are due to widespread disease in the farming areas and to the stocking of seed that is produced mainly from diseased wild broodstock. It is important to increase the supply of seed produced from domesticated, genetically improved broodstock and free of the key diseases, and improve biosecurity in the farms. In addition, there are constraints in the quality of inputs such as feed and chemicals, shortcomings in gher infrastructure & water supply, in farmers' knowledge of appropriate improved farming methodologies and in their access to finance and technical support services. To help address these issues the SAFETI technical team has developed three semi-intensive farming methodologies for small-scale extensive farmers. These have been built following review of available technical information and in consultation with local farmers and other stakeholders. The three methodologies are matched to the water salinity patterns in the different areas and to their other relevant ecological conditions. The three methodologies are:



Biosecurity measures to prevent cross-contamination and reduce disease risk

1. **Bagda monoculture:** in 10-25‰ salinity areas, stocking a batch of shrimp (bagda) PL at the rate of 20,000 – 40,000 per hectare to achieve a production target of 500 – 1,000kg/ha in 120 – 150 days, and without the need for additional mechanical aeration. In some areas a second production cycle is possible the same year.
2. **Bagda and golda rotational culture:** in 5-12‰ salinity areas, a first crop of shrimp (bagda), stocking a batch of PL at the rate of 20,000 – 30,000 per hectare to achieve a production target of 500 – 600 kg/ha of shrimp in 100 - 120 days, again without any additional mechanical aeration. After harvesting the bagda, and when the annual rains have lowered salinities, stocking a batch of freshwater prawn (golda) PL and fish fingerlings with a production target of 500 – 600 kg/ha or prawns and a similar quantity of fish in 140 - 160 days.
3. **Golda – carp polyculture:** in very low salinity and freshwater areas, farming of golda and selected carp fish together, to produce 750 – 1,000 kg/ha prawn and 1,000 kg/ha fish in 6 – 8 months.

The SAFETI technical team has identified that **success in shrimp farming depends on success in managing diseases** by applying science-based management practices. SAFETI has identified **six key steps** to reduce the risk of disease incidence, improve farming conditions and increase production, productivity and income.

Step-1: Increase pond depth to 3 – 5 feet and prepare a clean pond bottom: Most of the brackish water shrimp gher (pond) in Khulna division are very shallow, only 1 – 2 feet in depth. This is insufficient for good shrimp and prawn aquaculture. Water quality parameters like pH, temperature, dissolved oxygen and salinity can fluctuate markedly in shallow ponds during a 24 hour period due to heat from the sun or when it rains. Shrimp and prawns are then exposed to stress and become more susceptible to disease. Increasing pond depth helps stabilize the pond conditions, increase the habitat area for the animals and is one of the key factors for increasing production. Starting the grow-out cycle with a clean pond bottom, removing anoxic mud and debris from the previous cycle, is important in

reducing disease, maintaining water quality and maximizing the productive area of the pond.

Step-2: Ensure appropriate biosecurity to prevent cross-contamination: Preventing disease risk by controlling the entrance of external carriers of pathogens (crabs, zooplankton, snakes, frogs, cattle or other animals) to the pond is of paramount importance. Pond dikes should be compacted so as to be leak proof and be surrounded by small meshed net to restrict access. At the entrance to the pond, a foot bath and hand basin prepared with disinfectant solution should be established and a notice posted about the importance of using them.

Step-3: Disinfect the water and remove potential disease threats: 12 – 15 days before shrimp or prawn seed (PL) is stocked in the pond, the water should be treated with bleaching powder (calcium hypochlorite) to kill pathogens and carriers of pathogens.

Step-4: Stock healthy shrimp seed (SPF or PCR tested PL): In semi-intensive shrimp farming, stocking of healthy seed produced from domesticated, and genetically improved specific pathogen free (SPF) brood stock is the key to success. Seed produced from wild broodstock, but screened for key diseases by PCR can be used as a back-up when supply of PL from SPF broodstock is insufficient. Stocking good seed at an appropriate density reduces the risk of disease and increases the chance of improving productivity and profitability.

Step-5: Use good quality feed: To ensure optimum growth and maximize profit, application of good quality feed at the right time and in the right quantity, regularly, is vital. Feed should have 1-2 hour water stability, 30 – 40% crude protein and a good nutritional profile, including the correct proportions of carbohydrate, fat, vitamins and minerals, and balance of amino acids.

Step-6: Ensure good water quality and shrimp health: Regular monitoring and management of water quality parameters and shrimp health is important.

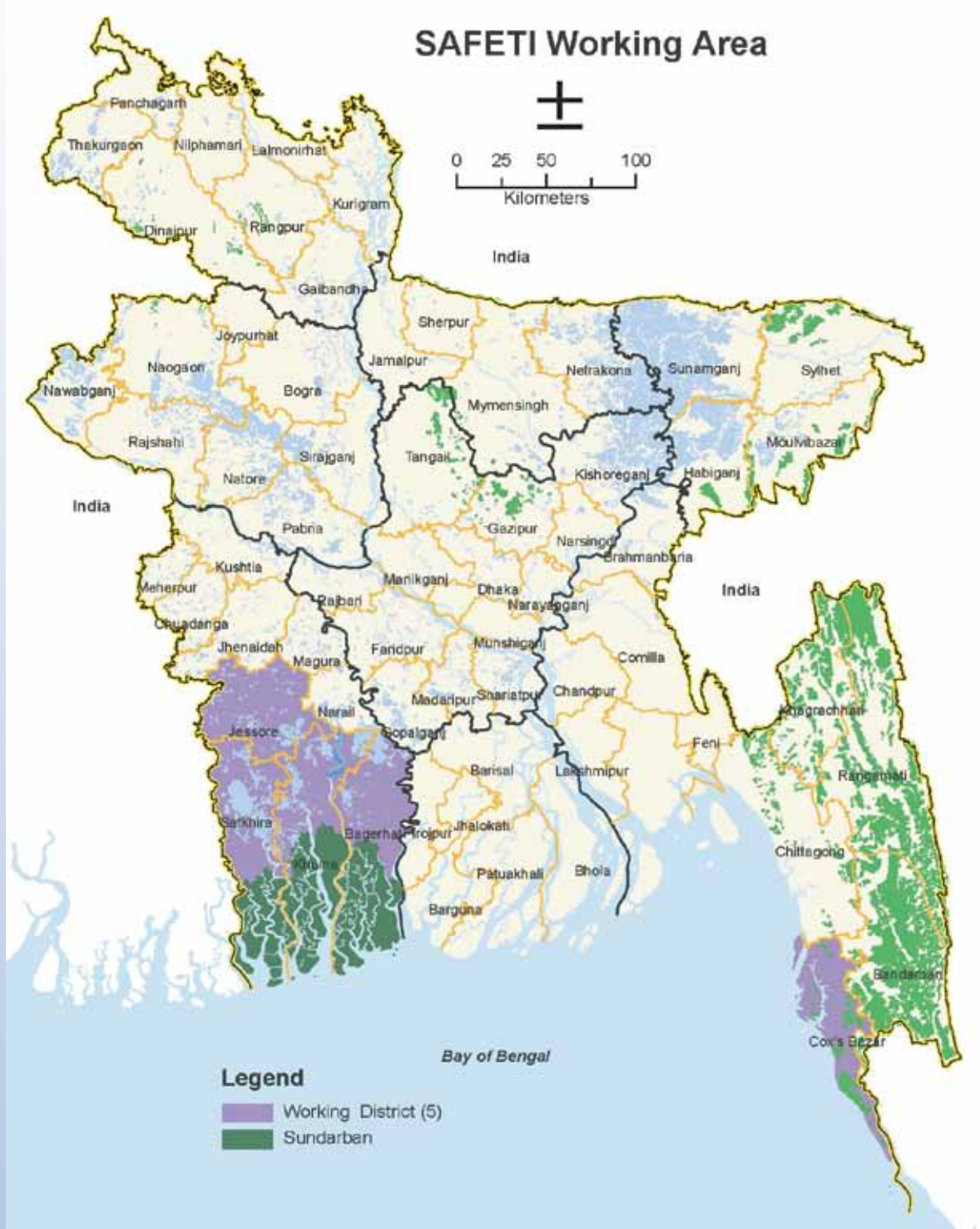


Feed monitoring

The SAFETI technical team believes that by adopting these six key steps Bangladesh small-scale shrimp farmers can reduce their risk of disease incidence and increase farming productivity and profitability.



Districts where the SAFETI is working



Safe Aqua Farming for Economic and Trade Improvement (SAFETI)

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